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TITLE: Weight Measurements and Standards for Soldiers

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14. ABSTRACT The purpose of this three-year study is to: 1) implement a computerized database to track the fatness and physical performance of Reservists assigned to the 94th RRC and 804th Medical Brigade, 2) provide the 94th RRC and 804th Medical Brigade with an environmental/internet-based intervention to increase health risk communication and promote healthy body weight/fatness and physical performance, 3) monitor the fatness and physical performance of the Reservists for two years following a one-year baseline period to evaluate the efficacy of the intervention, and 4) evaluate consumer satisfaction with the intervention.				
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Introduction:

The primary aims of this three-year study are to: 1) implement a computerized database to track the fatness and physical performance of Reservists assigned to the 94th Regional Readiness Command (RRC) and 804th Medical Brigade (MED BDE) (collectively called “New England Reserve Units”), 2) provide the New England Reserve Units with an environmental/internet-based intervention to increase health risk communication and promote healthy body weight/fatness and physical performance, 3) monitor the fatness and physical performance of the Reservists for two years following a one-year baseline period to evaluate the efficacy of the intervention, and 4) evaluate consumer satisfaction with the intervention.

Body:

This project delivers a weight measurement system for Army Reserve soldiers in the New England Reserve Units and an internet-based intervention for assisting soldiers’ adherence to body weight and physical fitness standards described in AR 600-9. The internet-based program, called H.E.A.L.T.H. (Healthy Eating, Activity, and Lifestyle Training Headquarters), is integrated with an environmental health promotion program that uses the command structure and existing communication functions to promote the use of the internet-based intervention. This approach can be viewed as a population-based health promotion program that will be integrated into existing programs that are designed to assist overweight or unfit soldiers, e.g., the Fit, Fight for Life program (formerly Wounded to Warrior program). Pennington Biomedical Research Center (PBRC) personnel work closely with an Executive Committee to guide this research project. During the first year, the primary objectives were: 1) collection of baseline data from the Army Physical Fitness Test (APFT), i.e., height, weight, fatness estimates, and measures of fitness, 2) assess the unique health risk communication, weight management, and fitness needs of

the New England Reserve Units, and 3) development of the H.E.A.L.T.H. intervention for implementation in Years 2 and 3. During Years 2 and 3, the primary objectives are: 1) implementation of the H.E.A.L.T.H. intervention, 2) collection of data on height, weight, fatness, and fitness to evaluate the effectiveness of the H.E.A.L.T.H. intervention, and 3) analysis of the data and dissemination of the results. We are currently in Year 1 of the project.

We are continuing to make significant progress towards our goals. Currently, we are working with three key individuals in the New England area, LTC Jack Sherman, Mr. Robert Spera, and Mr. Lorenzo Sordoni III. LTC Sherman is employed in the 94th RRC's Human Resources Department at the 94th RRC Headquarters, and thus, he is onsite five days per week. In addition, LTC Sherman is a member of the 94th RRC. Robert Spera and Lorenzo Sordoni III have also been employed to assist with implementation of the program.

Since the previous report in March of 2006, we have made consistent progress. Our main concern in the early months of 2006 was the quality of the Regional Level Application Software (RLAS) data, which captures the APFT data for reserve soldiers. Data were collected for New England Reserve Units during the period from January 1, 2005 to December 31, 2005. There were 4,556 observations collected from 2,770 unique soldiers. Among them, 67 records missed weight or height measurement (1.4%). Fifty nine percent of records ($n = 2,626$) passed screening table weight, and 41% of records ($n = 1823$) exceeded their weight-for-height allowance. For 1,823 records exceeding their weight-for-height allowance, the circumference measurements were required; 260 records were missed. Keeping only one record for each soldier out of the entire year, there were 2,178 males and 553 females. The demographic information by gender is summarized in Table 1.

Table 1: Demographic information by gender for Reservists in year 2005.

		N	Mean	Std dev	Min	Max
Women	Age	553	31.7	11.1	18	58
	Height (inch)	553	64.4	2.5	58	71
	Weight (lb)	553	145.0	23.6	97	249
	Weight Deviation (lb)	553	3.8	19.4	-46	95
	BMI	553	24.6	3.4	16.4	40.3
Men	Age	2178	31.4	10.3	17	60
	Height (inch)	2178	69.7	2.7	61	79
	Weight (lb)	2178	185.0	29.2	108	336
	Weight Deviation (lb)	2178	-0.5	24.5	-79	128
	BMI	2178	26.8	3.6	16.0	44.4

Table 2 shows the weight measurement and circumference measurement pass/fail rates.

Table 2: Weight and body fat percent measurement by gender for Reservists in year 2005.

	N	Passing Screening Weight	Taped/ Passed	Taped/ Failed	Missing
Women	553	53.2%	30.0 %	8.1 %	8.7 % ^a 18.6% ^b
Men	2178	57.9%	24.9 %	11.0 %	6.2% ^a 14.7% ^b
Total	2731	56.9%	25.9 %	10.4 %	6.7 % ^a 15.5% ^b

Note: %a = (# of soldiers with missing fat percent / # of total soldiers) * 100%

%b = (# of soldiers with missing fat percent /# of soldiers who failed screening weight) * 100%

The mean for PT test total scores was 210.6. The PT scores for women and men did not differ (see Table 3).

Table 3: PT test total scores by gender for Reservists in year 2005.

	N	Mean	Std Dev	Min	Max
Women	493	211.7	47.8	58	300
Men	2044	210.3	45.6	47	300
Total	2537	210.6	46.0	47	300

The PT test pass rate in year 2005 was 69%, and there was no difference in pass/fail rates for women versus men (see Table 4).

Table 4: PT test pass/fail rate by gender for Reservists in year 2005.

	N	Pass	Fail
Women	493	70.4%	29.6 %
Men	2044	68.8 %	31.2 %
Total	2537	69.1 %	30.9 %

Although we were pleased with the initial set of data received from RLAS, we concluded that improvement in the measurement procedures and outcomes could be made. For example, the equipment used by many Reserve units to measure height and weight were somewhat old and in poor condition. Also, we observed some deviation (in isolated cases) from the protocol for measuring height and weight (AR600-9). In response to this observation we purchased weight scales and height stadiometers for each of the unit facilities, observed APFT testing, and have recently created APFT informational cards for the New England Reserve Units. The scales and stadiometers have been delivered and installed at nearly all of the units. Mr. Spera and Mr. Sordoni have been instrumental in observing APFT testing at reserve units. These observations led to the conclusion that the APFT was being administered according to protocol.

The APFT informational cards are designed for training NCOs and to provide pertinent information on adhering to the APFT protocol using written and visual aids (The visual aid is provided in Appendix A.) This tool was developed with input from LTC Sherman and a training NCO within the 94th RRC.

During the latter part of 2006, we turned our attention to strategies designed to promote the H.E.A.L.T.H. website as well as alter the website to make it appropriate for New England Reservists. We are working closely with Linda Jelenewski in the Public Affairs Office of the 94th RRC on promotion strategies. One of the main health promotion strategies will utilize the Ambassadors of the 94th RRC and 804th MED BDE to disseminate information about the website. We have also devised a plan to utilize “liaisons” within each unit to inform soldiers about the program and to deliver promotional items. Two new generals have been commissioned for the 94th RRC and 804th MED BDE in July and October, respectively. Although we have verbal support from both commands, we anticipate meetings with them in October 2006. Concerning website adaptation, we have sought advice from those within the 94th RRC.

The H.E.A.L.T.H. website for Fort Bragg launched on July 25, 2006, thus allowing us to show the website to select individuals in New England. Some of the changes currently in progress are designed to increase information on fitness, provide information related to the impact of weather on exercise activities, incorporating a New England leisure section, and improvements to the time management and family modules. The site will also allow soldiers to specifically select activities from one of the six states within the New England Reserve Units.

Key Research Accomplishments:

- APFT RLAS test data collected for 2005
- APFT RLAS data analyzed

- Site visits to New England to observe PT testing and to develop environmental strategies
- Purchased and began installation of scales and stadiometers at units
- Created informational cards for adherence to APFT protocol
- Devised a promotional plan utilizing liaisons within each unit
- Began modification of website from Fort Bragg for use in the New England area
- Meetings and travel details are highlighted in Appendix B

Reportable Outcomes:

Since the project is in the first year, there are no reportable outcomes.

Conclusions:

Website specification and adaptation is nearing completion with the anticipated launch date between March 2007 and July 2007. Initial promotion of the website will begin in January 2007. Collection of data during APFT testing will continue through October 2006. A complete schedule of events for this study can be found in Appendix C.

We are currently spending the initial year of funding (Oct 2005- Sept 2006) at a rate that is appropriate for the three-year study with funding provided each year. This rate will accommodate the anticipated growth of the project and will allow for initial planning for an expansion of the Weight Measurements and Standards for Soldiers project for the next objective. We will also begin planning for the cluster randomization study that was described in the application for funding (Weight Measurements and Standards for Soldiers--- Contract # W81XWH-05-2-0082). This planning will require identifying other Reserve Corps in the U.S. who will agree to participate in a randomized controlled study that will randomly assign Reserve units to the H.E.A.L.T.H. intervention or a control intervention. Finally, Dr. Corby Martin has extended the earlier work of Dr. Donald Williamson related to the digital photography method

for objectively measuring food intake of soldiers in a free-living environment and has begun to experiment with innovative methods for collecting food intake, energy expenditure, and body weight data using remote data collection methods.



Appendix A
Army Regulation 600-9 Visual Aid

ARMY REGULATION 600-9
QUICK REFERENCE AND VISUAL AID

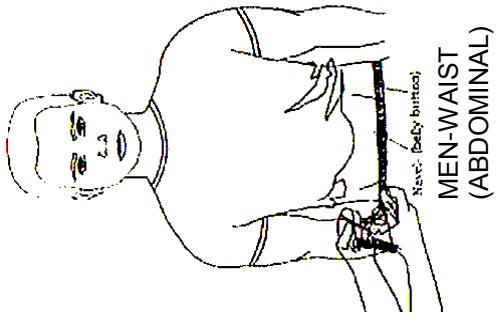
HEIGHT

- MUST BE IN STOCKING FEET
(WITHOUT SHOES)

WEIGHT

- MUST BE IN STANDARD PT
UNIFORM
- HEAD MUST BE HELD IN A
HORIZONTAL POSITION, LOOKING
FORWARD WITH THE LINE OF
VISION HORIZONTAL, AND CHIN
PARALLEL TO THE FLOOR
- BODY MUST BE STRAIGHT BUT
NOT RIGID
- MEASUREMENT WILL BE
RECORDED TO THE NEAREST $\frac{1}{2}$
INCH
- ALL WEIGHT MEASUREMENTS
MUST BE ROUNDED TO THE
NEAREST POUND.
 - IF THE WEIGHT FRACTION OF
THE SOLDIER IS LESS THAN $\frac{1}{2}$
POUND, ROUND DOWN TO THE
NEAREST POUND.
 - IF THE WEIGHT FRACTION OF
THE SOLDIER IS $\frac{1}{2}$ POUND OR
GREATER, ROUND UP TO THE
NEXT WHOLE POUND.

BODY-FAT TAPING FOR MEN



- SOLDIERS MUST BE IN STANDARD PHYSICAL TRAINING UNIFORM.

- MEASUREMENT TAPE MUST EITHER BE $\frac{1}{4}$ INCH OR $\frac{1}{2}$ INCH IN WIDTH AND MUST BE EITHER VINYL OR FIBERGLASS.
- ALL BODY FAT MEASUREMENTS MUST BE RECORDED TO THE NEAREST $\frac{1}{2}$ INCH.

- EACH CIRCUMFERENCE MEASUREMENTS MUST BE TAKEN 3 TIMES. THE VARIANCE OF EACH 3 MEASUREMENTS MUST BE WITHIN $\frac{1}{2}$ INCH OF EACH OTHER.

- **FOR MALES:** EACH SET OF CIRCUMFERENCE MEASUREMENTS MUST BE COMPLETED SEQUENTIALLY (ABDOMINAL, NECK, ABDOMINAL, NECK, AND ABDOMINAL, NECK)

- **FOR FEMALES:** EACH CIRCUMFERENCE MEASUREMENTS MUST BE COMPLETED SEQUENTIALLY (NECK, WAIST, HIP, NECK, WAIST, HIP AND NECK, WAIST, HIP)

WAIST (ABDOMINAL) MEASUREMENT:

- MEASURE NATURAL WAIST CIRCUMFERENCE AGAINST THE SKIN AT THE POINT OF MINIMAL CIRCUMFERENCE.
- THE SOLDIER'S ARMS MUST BE AT THE SIDES.
- TAKE MEASUREMENTS AT THE END OF THE SOLDIER'S NORMAL RELAXED EXHALATION.

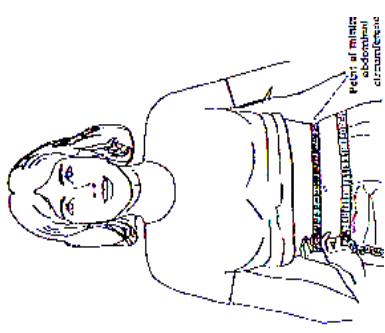
NECK CIRCUMFERENCE:

- MEASURE THE SOLDIER'S NECK AT A POINT JUST BELOW THE ADAM'S APPLE AND PERPENDICULAR TO THE LONG AXIS OF THE NECK.
- THE SOLDIER SHOULD LOOK STRAIGHT AHEAD WITH SHOULDERS DOWN BUT NOT HUNKED.

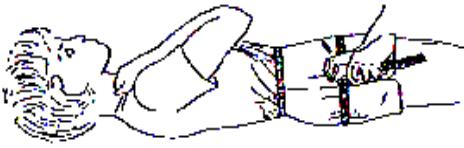
HIP CIRCUMFERENCE (WOMEN ONLY):

- MEASURE THE SOLDIER'S HIP CIRCUMFERENCE WHILE FACING HER RIGHT SIDE.
- POSITION THE TAPE AROUND THE GLUTEAL MUSCLES (BUTTOCKS) AT THE POINT OF THE GREATEST PROTRUSION.
- BE SURE THE TAPE IS LEVEL AND PARALLEL TO THE FLOOR.

BODY-FAT TAPING FOR WOMEN



WOMEN-WAIST
(ABDOMINAL)



WOMEN-NECK



MEN-NECK

WOMEN-HIP

Appendix B

Summary of Travel

Date	Location	Travelers	Purpose
08/28/05	Boston, MA	Donald Williamson Ray Allen	Meet with Army personnel regarding the Army grant
10/11/05	Boston, MA	Donald Williamson Ray Allen Carolyn Brinkley Corby Martin Danielle Bellotte Tiffany Stewart	Executive Committee meeting
11/15/05	Boston, MA	Donald Williamson Ray Allen	Meet with Army personnel regarding the Army grant
01/17/06	Baton Rouge, LA	Margaret Laneri	Meet at PBRC to become oriented to the 94 th RRC Army grant
04/19/06	Devens, MA	Robert Newton, Jr. Kim Bowen	Briefed New England personnel, initial discussions on website, promotion and adaptation Observed APFT testing Hired Robert Spera
07/05/06	Devens, MA	Robert Newton, Jr. Kim Bowen	Briefed UAs/Senior Civilian from 167 th on website, promotion and adaptation Solidified 94 th PAO & FSG role in promotion
07/05/06	Devens, MA	Robert Newton, Jr. Kim Bowen	Briefed UAs/Senior Civilian from 167 th on website, promotion and adaptation Solidified 94 th PAO & FSG role in promotion
07/23/06	Fort Bragg, NC	Donald Williamson Ray Allen Tiffany Stewart Robert Newton, Jr. Sandra May Kim Bowen	Executive Committee Meeting

Appendix C

Timeline of Project: New England

